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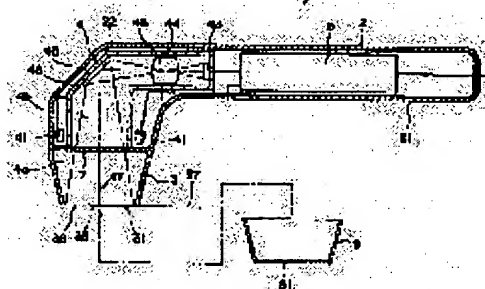
NUKUI MAKOTO

(54) DATA SYMBOL READER

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the reading accuracy of a data symbol by preventing the mixture of foreign matters, the sticking of stains, the scratches, etc., while a data symbol reader is not working.

SOLUTION: A data symbol reader has a casing 2 consisting of a grip part 21 and a head part 22. The part 22 includes a reading part 4 consisting of a pair of light sources 41 which illuminate a symbol reading area 36, a CCD (imaging device) 43 and an optical system 44 which turns the light reflected from the area 36 into an image on the photodetection surface of the CCD 43. The part 22 has a casing 3 which is extended toward the area 36 and has an opening 31 at its tip. A cover body 9 is attached at the tip part of the casing 3 in a removable way. When the body 9 is attached to the casing 3, the bottom part 91 of the body 9 covers the opening 31 of the casing 3.



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CLAIMS

[Claim(s)]

[Claim 1] The data symbol reader which is a data symbol reader which reads said data symbol through opening which was equipped with the reading section which has the optical system to which image formation of an image sensor and the image of a data symbol is carried out to the light-receiving side of said image sensor, and casing which contains this reading section, and was formed in said casing of said reading section, and is characterized by preparing the lid which can cover said opening free [attachment and detachment] to said casing.

[Claim 2] Said lid is a data symbol reader according to claim 1 which is what has protection-from-light nature.

[Claim 3] The data symbol reader according to claim 1 or 2 with which the data symbol is prepared in the location which meets said opening of said lid.

[Claim 4] The data symbol reader according to claim 1 or 2 which prepared the data symbol which has the information about a functional setup of a data symbol reader in the location which has a functional setting means to set up many functions of a data symbol reader based on the information read in said reading section, and meets said opening of said lid.

[Claim 5] Said data symbol is a data symbol reader according to claim 3 or 4 installed exchangeable to said lid.

[Claim 6] The data symbol reader according to claim 5 which comes to form the slit which can pass the support plate with which said data symbol was given to the flank of said lid.

[Claim 7] Said opening is a data symbol reader according to claim 1 to 6 currently formed at the tip of the case projected and formed in the end section of said casing.

[Claim 8] The data symbol reader according to claim 1 to 7 said whose data symbol is a two-dimensional data symbol.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the data symbol reader which reads coded information like for example, a two-dimensional data symbol.

[0002]

[Description of the Prior Art] In order to apply today, for example, a POS system etc., goods information is bar-code-ized and the approach and equipment which are read with a bar code reader have spread. However, reading of a bar code scans in the array direction of a bar, and is read in one dimension, and a limitation is in amount of information.

[0003] Then, the two-dimensional data symbol by which the monochrome mosaic pattern was arranged two-dimensional, and the data symbol reader which reads this are developed as what can support recent years more much information. It has the thing of a configuration of carrying out vertical scanning and reading two-dimensional by moving the reading section and a data symbol relatively [direction / which intersects perpendicularly with a main scanning direction] while carrying out horizontal scanning of it to the thing of a configuration of reading the pattern of a data symbol to coincidence two-dimensional using an image sensor, for example, an area sensor like CCD, for every line using a line sensor, if this data symbol reader is divided roughly.

[0004] Among these, the thing of the configuration using an image sensor (area sensor) does not have to carry out relative movement of the reading section and a data symbol for vertical scanning, is excellent in the point that reading is possible for a short time, and attracts attention.

[0005] The cross-section structure of the conventional data symbol reader of the configuration using this image sensor is shown in drawing 7. As shown in this drawing, the reading section 102 which consists of optical system 104 to which the conventional data symbol reader 100 carries out image formation of an image sensor (CCD) 103 and the image of the data symbol 38 in the symbol reading field 36 to the light-receiving side of an image sensor 103 inside a tip casing 101 side (head section) is built in. Optical system 104 consists of a lens 105 and a mirror 106, and the perimeter of an optical-path part reached to the symbol reading field 36 has structure covered with the case 107 extended from casing 101 from the mirror 106. The tip opening 108 of the rectangle which includes the symbol reading field 36 is formed at the tip of this case 107.

[0006] And at the time of reading, a case 107 is read and it moves in the predetermined direction on a field 110, and alignment is carried out so that a data symbol 38 may enter in the tip opening 108 36 of a case 107, i.e., a symbol reading field.

[0007] However, in such a conventional data symbol reader 100, since the tip opening 108 of a case 103 has always opened wide, foreign matters and moisture, such as dust and dust, trespass upon the interior of equipment from this tip opening 108, and it becomes the cause of failure, or it adheres to the light-receiving side of an optic or an image sensor 103 where a foreign matter constitutes optical system 104, it becomes a noise at the time of reading, and there is a problem that where of this noise may read owing to and an error may arise.

[0008] Then, as the alternate long and short dash line in drawing 7 shows, it is possible to install the glass plate 109 for protection against dust between a mirror 106 and the tip opening 108. In this case, although invasion of the foreign matter inside equipment, moisture, etc. can be prevented to some extent, since a foreign matter may adhere to the front face of a glass plate 109, or the front face of a glass plate 109 may get damaged, this foreign matter and blemish read and it becomes a noise at the time, it is always necessary to defecate the front face of a glass plate 109. However, since this glass plate 109 is located in the inner part of the tip opening 108, cleaning is hard to carry out it and it requires time and effort.

[0009]

[Problem(s) to be Solved by the Invention] invasion of the foreign matter [purpose / of this invention] at the time of un-using it, and adhesion of dirt -- getting damaged -- etc. -- it prevents and is in offering the data symbol reader which can improve reading precision.

[0010] Moreover, other purposes of this invention prepare a data symbol in a lid, and are by reading this data symbol to offer the data symbol reader which can perform a functional setup of equipment etc. easily.

[0011]

[Means for Solving the Problem] Such a purpose is attained by this invention of following the (1) - (7).

[0012] (1) The data symbol reader which is a data symbol reader which reads said data symbol through opening which was equipped with the reading section which has the optical system to which image formation of an image sensor and the image of a data symbol is carried out to the light-receiving side of said image sensor, and casing which contains this reading section, and was formed in said casing of said reading section, and is characterized by preparing the lid which can cover said opening free [attachment and detachment] to said casing.

[0013] (2) Said lid is a data symbol reader given in the above (1) which is what has protection-from-light nature.

[0014] (3) The above (1) to which the data symbol is prepared in the location which meets said opening of said lid, or a data symbol reader given in (2).

[0015] (4) The above (1) which prepared the data symbol which has the information about a functional setup of a data symbol reader in the location which has a functional setting means to set up many functions of a data symbol reader based on the information read in said reading section, and meets said opening of said lid, or a data symbol reader given in (2).

[0016] (5) Said data symbol is a data symbol reader the above (3) installed exchangeable to said lid, or given in (4).

[0017] (6) A data symbol reader given in the above (5) which comes to form the slit which can pass the support plate with which said data symbol was given to the flank of said lid.

[0018] (7) Said opening is a data symbol reader the above (1) currently formed at the tip of the case projected and formed in the end section of said casing thru/or given in either of (6).

[0019] (8) The above (1) said whose data symbol is a two-dimensional data symbol thru/or a data symbol reader given in either of (7).

[0020]

[Example] Hereafter, the data symbol reader of this invention is explained to a detail based on the suitable example shown in an accompanying drawing.

[0021] The bottom view of the case in the data symbol reader which shows the cross-section side elevation in which drawing 1 shows the example of the data symbol reader of this invention, and drawing 2 to drawing 1 , and drawing 3 are the block diagrams showing the circuitry of the data symbol reader shown in drawing 1 .

[0022] As shown in these drawings, the data symbol reader 1 of this invention It has the casing 2 which consisted of the longwise grasping section 21 grasped by hand and the head section 22 of the shape of L character formed in the end. In the grasping section 21 The digital disposal circuit 5, the light source drive circuit 42, and the driver 16 grade for a communication link which are mentioned later are contained, and the reading section 4 which receives the light from the symbol reading field 36 is

contained in the head section 22.

[0023] The reading section 4 consists of the light source (lighting system) 41 of the pair which illuminates the symbol reading field 36, CCD (charge coupled device) 43 which is an image sensor, optical system 44 drawn so that image formation of the light (this example reflected light) from the symbol reading field 36 may be carried out to the light-receiving side of CCD43, and supporter material 48 which supports these.

[0024] Optical system 44 consists of a mirror 45 mostly crooked in the direction of a right angle in the optical path 47 of the reflected light from the symbol reading field 36, and a lens (or lens group) 46 to which the light-receiving side of CCD43 is made to carry out image formation of the light reflected by the mirror 45.

[0025] Both the light sources 41 are mostly installed in the lower limit section side of the supporter material 48 by the symmetry through the optical path 47. As the light source 41, a light emitting device like LED, a halogen lamp, etc. can be used, for example. In addition, in order to make the brightness of the symbol reading field 36 into homogeneity more, the diffusion plate (not shown) which has a split face is installed in the luminescence side of the light source 41. This diffusion plate is obtained by, for example, performing split-face processing to some transparence plates mentioned later. The light source drive circuit 42 which turns this on is connected to such the light source 41.

[0026] Many photodiode pixels are arranged in the shape of a matrix, and the charge according to the quantity of light of the light which each of each pixel received is accumulated, and it consists of CCD43 so that the sequential transfer of this charge may be carried out at the time of predetermined. This transmitted charge constitutes the picture signal of the read image.

[0027] The symbol reading field 36 is a field of this equipment proper formed on the reading side (field in which a data symbol 38 is located) 37, and is a field which the exposure of the light by the light source 41 can be made, and can receive the reflected light by CCD43, and can read data. This symbol reading field 36 includes the tip opening 31 almost in accordance with the tip opening 31 of the case 3 mentioned later. In addition, when reading in the condition of having equipped with the lid 9 mentioned later, the symbol reading field 36 is formed in the front face of the support plates 35A-35C installed in pars-basilaris-occipitalis 91 inside of a lid 9.

[0028] As shown in drawing 2, the data symbol (symbol code) 38 is constituted from this example by the mosaic (cel) of the black arranged by the x line xy train (x and y are two or more integers, respectively) or white (or transparence). The black or white of this mosaic expresses 0 or 1 in a binary system, and the information on desired is specified with this combination. In addition, it cannot be overemphasized that a data symbol 38 is not limited to the thing of a configuration like illustration.

[0029] The light which was constituted as mentioned above and which it read, and the light source 41 lit up by actuation of the light source drive circuit 42 in the section 4, and was emitted from both the light sources 41 is irradiated by the symbol reading field 36, image formation of that reflected light is carried out on the light-receiving side of CCD43 through optical system 44, and the picture signal (analog signal) according to this light-receiving quantity of light is outputted.

[0030] The head section 22 of casing 2 has the case 3 which extended and was formed in the symbol reading field 36 side from the reading section 4 as a guide member for specifying the distance to which the light-receiving side of CCD43 is made to carry out image formation of the image of a data symbol 38 with which it was placed into the symbol reading field 36 in order to maintain the reading section 4 at a predetermined distance (optical path length) from the symbol reading field 36 according to optical system 44. This case 3 is constituted so that the optical path of the illumination light from the light source 41 and the optical path 47 of the reflected light from the symbol reading field 36 may be surrounded mostly, and the cross section (cross section) parallel to that symbol reading field 36 is making the square.

[0031] Moreover, the case 3 is set as die length in which the light from the symbol reading field 36 carries out image formation to the light-receiving side of CCD43 according to optical system 44, when the tip reads and a field 37 is contacted.

[0032] The rectangular tip opening 31 is formed at the tip of a case 3. Moreover, the transparence plate 7

which has a protection-against-dust function is installed in the interior of a case 3 (inside the tip opening 31). This transparence plate 7 is installed in the location near the lower limit of said supporter material 48 so that the building envelope of a case 3 may be read with space 4a by the side of the tip opening 31 and it may divide to space 4b by the side of the section 4. As a transparence plate 7, what consisted of various glass and various plastics is usable. By forming such a transparence plate 7, foreign matters, moisture, etc., such as dust and dust, reading and invading into space 4b by the side of the section 4 is prevented.

[0033] Moreover, the data symbol reader 1 has the closed-end box-like lid 9 with which a point is equipped with a case 3 free [attachment and detachment] at least. At the time of wearing to the case 3 of a lid 9, the pars basilaris ossis occipitalis 91 of a lid 9 covers the tip opening 31 of a case 3.

[0034] A lid 9 consists of various metals, such as a Plastic solid of various plastics, such as polyethylene, polypropylene, a polycarbonate, and ABS plastics, or stainless steel, and aluminum, and has protection-from-light nature preferably.

[0035] At the time of un-using [of the data symbol reader 1] it, by equipping a case 3 with a lid 9 and covering the tip opening 31, invasion of the dust to space 4a, dust, etc. is prevented, and adhesion of the dust to the front face of the transparence plate 7, dust, dirt, a fingerprint, etc. is prevented. Moreover, since the lid 9 has protection-from-light nature, invasion of the outdoor daylight to the reading section 4 is prevented at the time of un-using [of equipment] it, and degradation of CCD43 grade can also be prevented.

[0036] Drawing 4 is the perspective view showing other examples of a configuration of the lid in the data symbol reader 1. Like said lid 9, the lid 90 shown in this drawing is a closed-end box-like member which has protection-from-light nature preferably, and can install the support plates (chart) 35A, 35B, and 35C with which data symbols 35A, 35B, and 35C were given to the inside of the location 91 which meets the tip opening 31 at the time of wearing to a case 3, i.e., a pars basilaris ossis occipitalis, exchangeable. In this case, each support plates 35A, 35B, and 35C are making the almost same configuration as the inside of a pars basilaris ossis occipitalis 91.

[0037] The slit 92 which support plates 35A-35C may pass is formed in the flank of pars-basilaris-ossis-occipitalis 91 near [a lid 90], with the condition of having equipped the case 3 with the lid 90, a slit 92 can be passed and the support plates 35A-35C installed in a lid 90 can be exchanged.

[0038] Drawing 5 is the top view showing the example of the data symbol given to the support plate. The data symbols 34A, 34B, and 34C given to the support plates 35A, 35B, and 35C shown in this drawing, respectively all have the information about a functional setup of the data symbol reader 1. Among these, it means that data symbol 34A starts the functional setting-operation of the data symbol reader 1, data symbol 34B expresses the contents of a functional setting (example: buzzer-on), and data symbol 34C means ending functional setting-operation.

[0039] In such a lid 90, when it equips with support plates 35A-35C, since the data symbols 34A-34C given to them serve as an always fixed and proper location to the symbol reading field 36 as opposed to a lid 90, they can read data symbols 34A-34C correctly.

[0040] Moreover, the data symbol to read can be exchanged, also being able to perform two or more different functional setup, and equipping a case 3 with a lid 90 especially to a lid 90, since the support plates 35A-35C are exchangeable.

[0041] The digital disposal circuit 5 which processes the picture signal from the reading section 4 in the casing 2 of the data symbol reader 1 is formed for example, on the printed circuit board. As shown in drawing 3, this digital disposal circuit 5 mainly consists of the CCD drive circuit 6, an amplifying circuit 8, the binary-ized circuit 10, memory 12, control means (CPU) 15, and these electrical connection Rhine.

[0042] Moreover, the switching circuit 13 of light source drive circuit 42, driver 16 for communication link and electric power switch (not shown), and trigger switch 11 grade is connected to a control means 15, and a display (not shown) like LCD (liquid crystal display component) or CRT etc. is further connected to it if needed.

[0043] The light source drive circuit 42 is a circuit which supplies power to the light source 41 and is

turned on to it, and the actuation is controlled by the control means 15. By ON of the trigger switch 11, a control means 15 operates the light source drive circuit 42, and, thereby, the light source 41 turns it on. Here, the lighting time amount of the light source 41 is set as the request by the light source drive circuit 42 or the control means 15.

[0044] Moreover, a control means 15 operates the CCD drive circuit 6 by ON of the trigger switch 11. A CCD horizontal driving pulse and a CCD vertical driving pulse are outputted to CCD43 from the CCD drive circuit 6, and are recording and a transfer of the charge in CCD43 are controlled.

[0045] Moreover, in the CCD drive circuit 6, a clock signal is generated and the signal (compound clock signal) which compounded the Horizontal Synchronizing signal and the Vertical Synchronizing signal with this signal further is sent out to a control means 15.

[0046] The picture signal (analog signal) by which a sequential output is carried out from CCD43 of the reading section 4 is amplified by the amplifying circuit 8, is changed into a digital picture signal by the A/D converter which is not illustrated, and is inputted into the binary-ized circuit 10.

[0047] In the binary-ized circuit 10, a digital picture signal is compared with threshold data, and is made binary. The binary-ized data outputted from the binary-ized circuit 10 are memorized to the predetermined address of memory 12 by the address counter built in the control means 15. This address counter is driven with the compound clock signal inputted from said CCD drive circuit 6.

[0048] From memory 12, the address (read-out sequence may be contrary to the time of the storage to memory 12) specified as said address counter is followed. Data are read one by one and it sets to the operation part of a control means 15 to the data for one screen. For example, reversal of an image, profile detection (data symbol 34A- extract of only the information about 34C and 38), the decoder which performs required image processings, such as drop out amendment and rotation, and is further built in a control means 15 -- data symbol 34A- it decodes to the data according to the system of 34C and 38.

[0049] Moreover, the data symbol reader 1 reads a data symbol in the reading section 4, and has a functional setting means to set up many functions of the data symbol reader 1, based on the information acquired by that cause. The main function of this functional setting means is attained by the control means 15.

[0050] The program about control of many actuation of equipments, such as reading of a data symbol and decoding, is beforehand stored in ROM, a control means 15 makes a selection change suitably in actuation based on this functional set point with reference to the predetermined functional set point stored in the nonvolatile memory (EEPROM) rewritable out of each program of operation in which two or more setup is possible, and desired actuation is performed by the control means 15.

[0051] On the other hand, the data symbol prepared in the lid 9 side has the information about the item and the function to choose of a functional setup. When ON / off functional setup of a buzzer is explained, as an example on the program of a control means 15 It is constructed so that "actuation which carries out [*****] a buzzer and reports it at the time of the completion of decoding", or "actuation which does not perform information at a buzzer even if decoding is completed" can be chosen based on this functional set point. The condition of the data of a storage region assigned to a buzzer turning-on-and-off setup in a nonvolatile memory is seen, and selection of operation is performed so that the former actuation may be performed when this value is "1", and the latter actuation may be performed in the case of "0."

[0052] In this example, it has the maintenance mode (mode in which modification actuation of the functional set point in a nonvolatile memory is performed (henceforth "functional setting mode")) of such a functional setup. When the read data are the code which shows special functional setting initiation, Usually, shift to functional setting mode from read mode, and the functional set point to which a nonvolatile memory corresponds based on the data symbol about a functional setup read after this is updated. It changes, and when the data symbol which shows functional setting termination is read, it usually returns to read mode from functional setting mode.

[0053] A trigger switch 11 is turned on, a data symbol is read, a control means 15 shifts to functional setting mode by decoding of data symbol 34A first, by data symbol 34B read next, actuation (renewal of

data in a nonvolatile memory) which rewrites to "1" the flag assigned to buzzer turning-on-and-off functional distinction of a nonvolatile memory is performed, and buzzer-on actuation is set up. And whenever a trigger switch 11 is turned on, decoding of a data symbol is performed, and a functional setup of the function corresponding to the decoding data of the data symbol is performed suitably. [0054] It continues until data symbol 34C which shows functional setting termination is read, and by decoding of data symbol 34C, this actuation returns to the usual read mode from functional setting mode, and performs many actuation based on the functional set point of the aforementioned nonvolatile memory. In addition, as other examples of the contents of a functional setting, a negative / positive change, mirroring, a cel matrix setup, a transmission-speed setup, shutter mode setting, etc. are mentioned, for example.

[0055] Next, actuation of the data symbol reader 1 is explained.

[1] If turning on and off of the trigger switch 11 is judged (step 200) and the trigger switch 11 is turned on where an electric power switch is set to ON as shown in drawing 6 at the time of a functional setup, the signal which reading of a data symbol was made, and predetermined signal processing which was mentioned above in the digital disposal circuit 5 was performed, and was processed by this digital disposal circuit 5 will be decoded by required data (step 201).

[0056] Decoding data judge whether it is data of functional setting initiation (step 202), and in being functional setting initiation data, it shifts to functional setting mode (step 203). (when data symbol 34A is read) Thereby, the writing to a nonvolatile memory is permitted.

[0057] It judges whether when decoding data are not functional setting initiation data as a result of decision of step 202, it is in functional setting mode further (step 204), and in being in functional setting mode, decoding data judge whether it is functional setting termination data (step 205). Consequently, in not being functional setting termination data, based on the decoding data, the functional setting data with which it corresponds in a nonvolatile memory are rewritten (when data symbol 34B is read) (step 206), and it returns to step 200 after that.

[0058] When decoding data are functional setting termination data as a result of decision of step 205, it returns to the usual read mode (normal mode) from functional setting mode (step 207). (when data symbol 34C is read) Thereby, rewriting of the data of a nonvolatile memory is forbidden.

[0059] Then, actuation by the normal mode is performed (step 208). In this case, that actuation is performed from the contents set up based on the functional set point data in a nonvolatile memory.

[0060] Moreover, when it is not in functional setting mode as a result of decision of step 204, actuation by the normal mode is performed (step 208). In addition, selection of the data symbols 34A-34C read at the time of a functional setup is performed by exchanging the support plates 35A-35C installed in a lid 90 through a slit 92.

[0061] [2] Usually, a lid 90 is removed from a case 3 at the time of reading, perform alignment so that a data symbol 38 may be located in the symbol reading field 36, carry out press actuation of the trigger switch 11, and set to ON. Thereby, reading of a data symbol 38 is made, and in a digital disposal circuit 5, predetermined signal processing which was mentioned above is performed and it is decoded by still more nearly required data.

[0062] This decoded data is inputted into a computer 17 like a personal computer or a workstation by which external connection was made by the driver 16 for a communication link, for example. Storing, a total, etc. of the inputted data are performed in such a computer 17.

[0063] As mentioned above, although the data symbol reader of this invention was explained based on each example of illustration, this invention is not limited to these. For example, the thing of what kind of configurations, such as polygons, such as not only the square like illustration but a triangle, a hexagon, an octagon, etc., and circular, an ellipse form, is sufficient as the cross-section configuration of a case 3, the configuration of the tip opening 31, and the cross-section configuration of lids 9 and 90. Moreover, in the data symbol reader of this invention, you may be the configuration that the data symbol is directly given to the bottom circles side of a lid etc.

[0064]

[Effect of the Invention] covering tip opening of a case with a lid at the time of un-using [of

equipment] it according to the data symbol reader of this invention, as stated above -- invasion of foreign matters, such as dust and dust, and adhesion of dirt -- getting damaged -- etc. -- it can prevent. [0065] The maintenance of equipment also becomes easy, while the noise which adhesion of a foreign matter etc. produces owing to in the case of reading is canceled and being able to improve reading precision, since it is such.

[0066] Moreover, the information about a functional setup of a data symbol reader can be read in the data symbol prepared in the lid, and, in a configuration so that a functional setup of a data symbol reader may be performed based on this information, a functional setup can be ensured [easily and].

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TECHNICAL FIELD

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PRIOR ART

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[0006] And at the time of reading, a case 107 is read and it moves in the predetermined direction on a field 110, and alignment is carried out so that a data symbol 38 may enter in the tip opening 108 36 of a case 107, i.e., a symbol reading field.

[0007] However, in such a conventional data symbol reader 100, since the tip opening 108 of a case 103 has always opened wide, foreign matters and moisture, such as dust and dust, trespass upon the interior of equipment from this tip opening 108, and it becomes the cause of failure, or it adheres to the light-receiving side of an optic or an image sensor 103 where a foreign matter constitutes optical system 104, it becomes a noise at the time of reading, and there is a problem that where of this noise may read owing to and an error may arise.

[0008] Then, as the alternate long and short dash line in drawing 7 shows, it is possible to install the glass plate 109 for protection against dust between a mirror 106 and the tip opening 108. In this case, although invasion of the foreign matter inside equipment, moisture, etc. can be prevented to some extent, since a foreign matter may adhere to the front face of a glass plate 109, or the front face of a glass plate 109 may get damaged, this foreign matter and blemish read and it becomes a noise at the

time, it is always necessary to defecate the front face of a glass plate 109. However, since this glass plate 109 is located in the inner part of the tip opening 108, cleaning is hard to carry out it and it requires time and effort.

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3. In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] covering tip opening of a case with a lid at the time of un-using [of equipment] it according to the data symbol reader of this invention, as stated above -- invasion of foreign matters, such as dust and dust, and adhesion of dirt -- getting damaged -- etc. -- it can prevent. [0065] The maintenance of equipment also becomes easy, while the noise which adhesion of a foreign matter etc. produces owing to in the case of reading is canceled and being able to improve reading precision, since it is such.

[0066] Moreover, the information about a functional setup of a data symbol reader can be read in the data symbol prepared in the lid, and, in a configuration so that a functional setup of a data symbol reader may be performed based on this information, a functional setup can be ensured [easily and].

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] invasion of the foreign matter [purpose / of this invention] at the time of un-using it, and adhesion of dirt -- getting damaged -- etc. -- it prevents and is in offering the data symbol reader which can improve reading precision.

[0010] Moreover, other purposes of this invention prepare a data symbol in a lid, and are by reading this data symbol to offer the data symbol reader which can perform a functional setup of equipment etc. easily.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross-section side elevation showing the example of the data symbol reader of this invention:

[Drawing 2] It is the bottom view of the case in the data symbol reader shown in drawing 1 .

[Drawing 3] It is the block diagram showing the circuitry of the data symbol reader shown in drawing 1 .

[Drawing 4] It is the perspective view showing other examples of a configuration of a lid.

[Drawing 5] It is the top view showing the example of the data symbol given to the support plate.

[Drawing 6] It is the flow chart which shows actuation of a control means.

[Drawing 7] It is the cross-section side elevation showing the configuration of the conventional data symbol reader.

[Description of Notations]

1 Data Symbol Reader

2 Casing

21 Grasping Section

22 Head Section

3 Case

31 Tip Opening

34A-34C Data symbol

35A-35C Support plate

36 Symbol Reading Field

37 Reading Side

38 Data Symbol

4 Reading Section

4a, 4b Space

41 Light Source

42 Light Source Drive Circuit

43 CCD

44 Optical System

45 Mirror

46 Lens

47 Optical Path

48 Supporter Material

5 Digital Disposal Circuit

6 CCD Drive Circuit

7 Transparence Plate

8 Amplifying Circuit

9 Lid

91 Pars Basilaris Osis Occipitalis
92 Slit
10 Binary-ized Circuit (Comparator)
11 Trigger Switch
12 Memory
13 Switching Circuit
15 Control Means (CPU)
16 Driver for Communication Link
17 Computer
100 Data Symbol Reader
101 Casing
102 Reading Section
103 Image Sensor
104 Optical System
105 Lens
106 Mirror
107 Case
108 Tip Opening
109 Glass Plate
110 Reading Side
200-208 Step

[Translation done.]

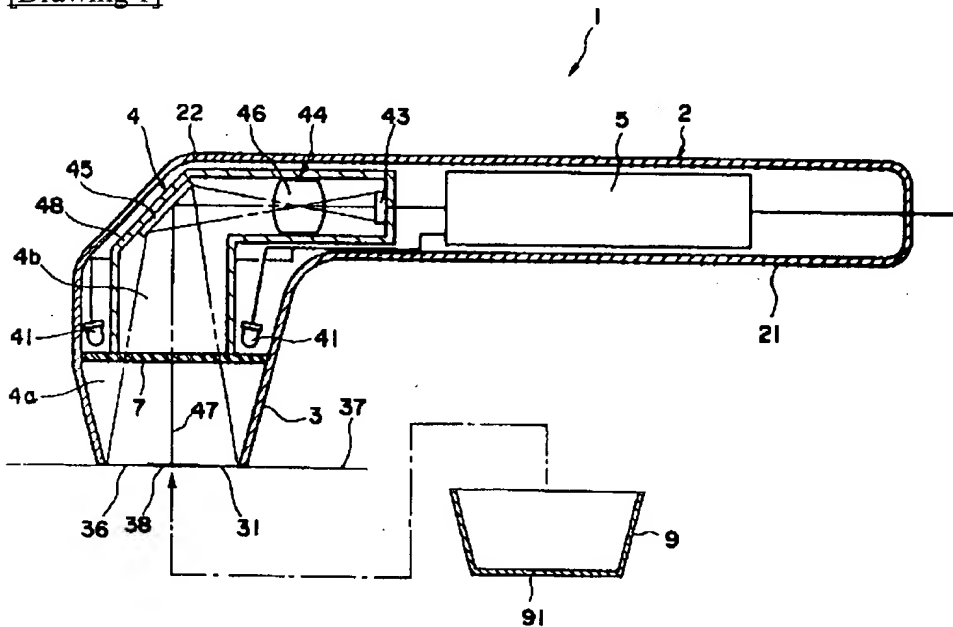
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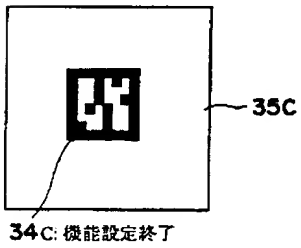
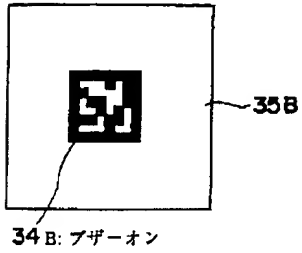
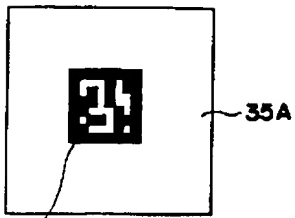
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DRAWINGS

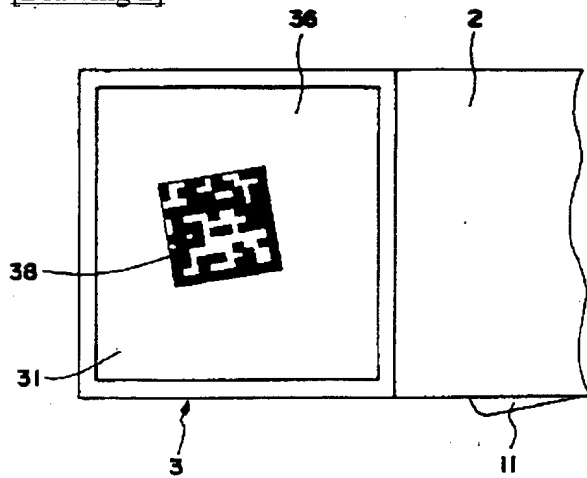
[Drawing 1]



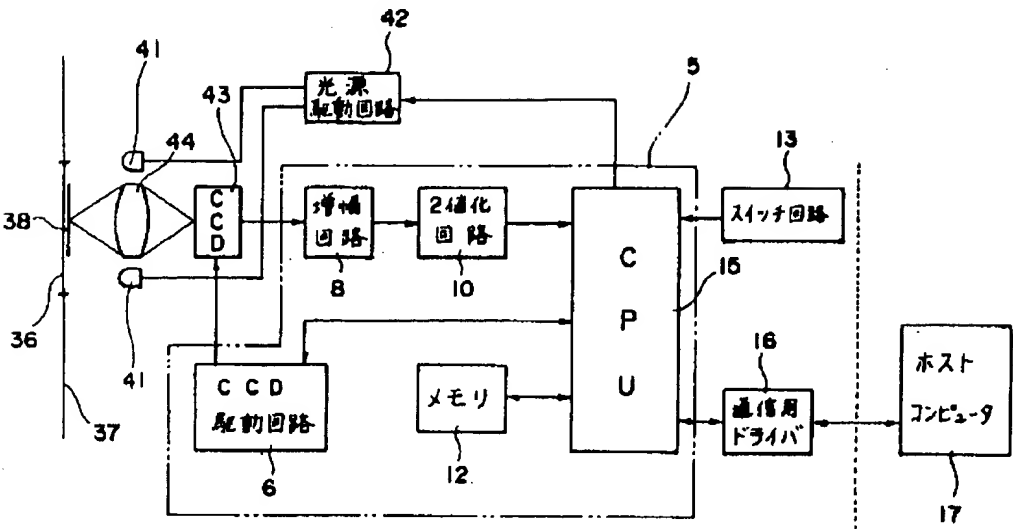
[Drawing 5]



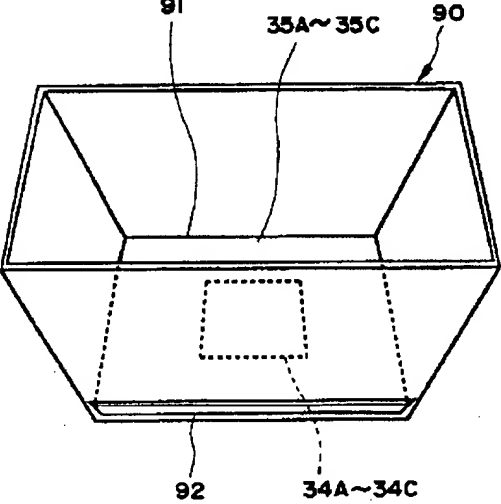
[Drawing 2]



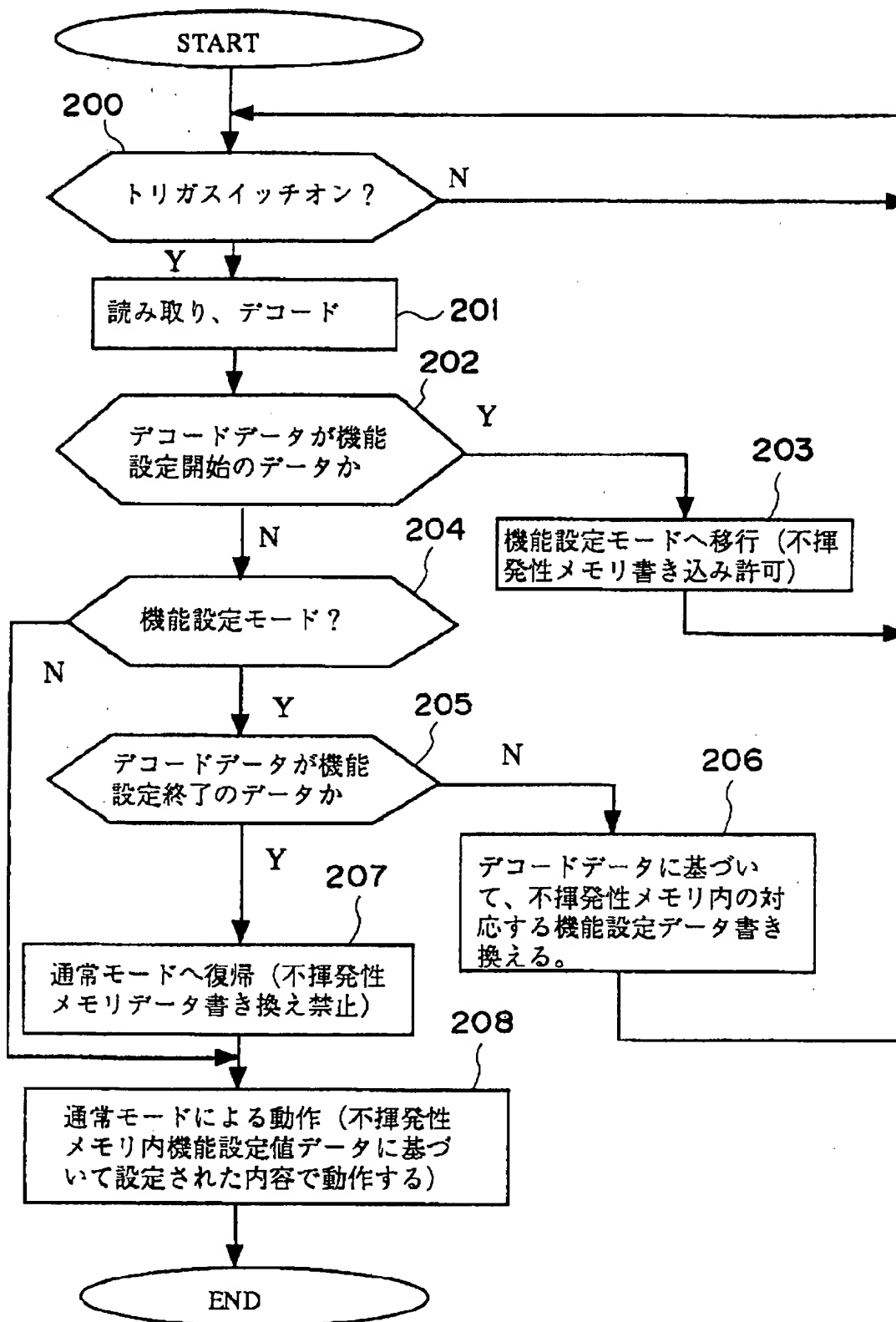
[Drawing 3]



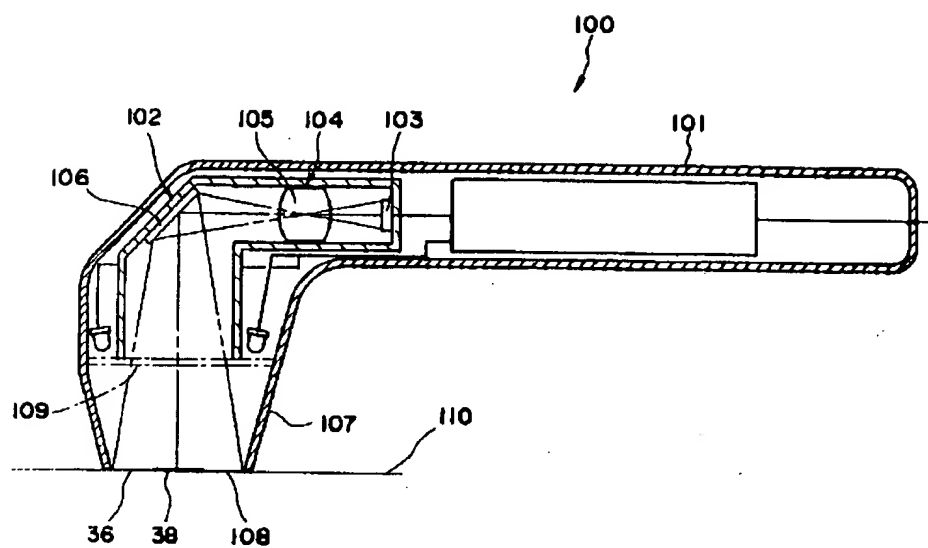
[Drawing 4]



[Drawing 6]



[Drawing 7]



[Translation done.]